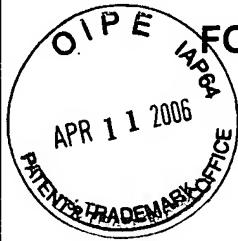


PRE-APPEAL BRIEF REQUEST
O I P E **FOR REVIEW**



Application Number	10/646,098
Filing Date	August 22, 2003
First Named Inventor	Tuller
Atty Docket Number	MIT-168
Art Unit	2874
Examiner	M. R. Connelly Cushwa

CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, or facsimile transmitted to the U.S. Patent and Trademark Office on the date shown below.

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4/5/06

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).

Note: No more than five (5) pages may be provided.

I am the

applicant/inventor

assignee of record of the entire interest.

See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. Natasha C. Us
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NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Sumit multiple forms if more than one signature is required, see below*.

*Total of _____ forms are submitted.



PATENT
Attorney Docket No. MIT-168
(058420/157392)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS: Tuller *et al.*
SERIAL NO.: 10/646,098 GROUP NO.: 2874
FILING DATE: August 22, 2003 EXAMINER: M. R. Connelly Cushwa
TITLE: METHODS FOR FABRICATING STRAINED LAYERS ON
SEMICONDUCTOR SUBSTRATES

Mail Stop AF
Commissioner for Patents
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COMMENTS ACCOMPANYING PRE-APPEAL BRIEF REQUEST FOR REVIEW

This paper is submitted along with a Pre-Appeal Brief Request for Review in accordance with the Official Gazette Notice dated July 12, 2005, and a Notice of Appeal in response to the Office action mailed by the U.S. Patent and Trademark Office on December 5, 2006, and the Advisory Action mailed February 22, 2006. A check for payment of the fee for filing the Notice of Appeal and for a one-month extension of time is submitted herewith, as well a petition for a one-month extension of time. Applicants believe that no additional fee is required for this submission to be entered. However, please consider this a conditional petition for the proper extension, if one is required, and a conditional authorization to charge any related extension fee, or any other fees, necessary for entry of this submission to Deposit Account No. 07-1700.

Applicants' **Remarks** begin on page 2 of this paper.

REMARKS

The Examiner has improperly rejected independent claims 1 and 9 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,198,269 to Swartz et al. (“Swartz”) in view of Rehrig et al., “Piezoelectric properties of zirconium-doped barium titanate single crystals grown by templated grain growth,” *Journal of Applied Physics*, Vol. 86, No. 2, August 1, 1999, pages 1657–1661 (“Rehrig”). The rejection of claim 9 is moot in view of the cancellation of that claim. The Examiner’s continued refusal to acknowledge the recitation in the claims of an optical buffer layer, as well as the Examiner’s failure to show proper motivation for modifying Swartz to include the material of Rehrig, constitute clear factual deficiencies in the rejections.

In the present case, the Examiner failed to find references which, even when combined, teach the limitations of claim 1. The Examiner also failed to show proper motivation for making the proposed modifications. The Examiner, in other words, has failed to consider the claim as a whole and has not met even the basic requirements of § 103(a). As a result, the Examiner has not established a *prima facie* case of obviousness.

It is well-established that to establish a *prima facie* case of obviousness, every element of the invention as claimed must be found in the prior art. *See In re Rouffet*, 149 F.3d 1350, 1357 (Fed. Cir. 1998) and M.P.E.P. §§ 2142, 2143. The burden is on the Examiner to demonstrate that each feature of a claim is met by a reference or valid combination of references. The courts have repeatedly and consistently held that “all limitations [of a claim] must be considered ... and it is error to ignore specific limitations in distinguishing over the references.” *In re Boe and Duke*, 184 USPQ 38, 40 (CCPA 1974). Moreover, to establish obviousness by modifying or combining references, there must be some suggestion or motivation to do so in the reference itself or in the knowledge generally available to one of ordinary skill in the art that lies outside the disclosure of the patent application. *See, e.g.*, M.P.E.P. §2142. Absent this motivation, a rejection under 35 U.S.C. § 103(a) is improper.

As stated on page 4 of our Amendment and Response After Final Action filed February 6, 2006 (the “Amendment”), Swartz discloses a buffer layer that enables the formation of additional layers thereon. The Examiner erred by equating the buffer layer of Swartz with the optical buffer layer recited in instant claim 1. In fact, the recommended material compositions disclosed by Swartz have high indices of refraction and are therefore unsuitable to serve as

optical buffer layers, i.e., they would not confine light within a modified barium titanate layer disposed thereon.

The Examiner also erred in relying on Rehrig for the disclosure of 2 to 20 mol % of $Zr(BaZrO_3)$, as recited in claim 1. As discussed on page 5 of the Amendment, Rehrig discloses this composition as having desirable piezoelectric properties. Rehrig is silent regarding the optical properties of this material. One of skill in the art would find no motivation in the cited art to modify the barium titanate or barium strontium titanate material suggested by Swartz for the formation of optical waveguides by substituting the Zr-doped barium titanate material of Rehrig to obtain the optical structure recited in independent claim 1.

A point of novelty of the claimed invention is the use of modified barium titanate containing zirconium in an optical structure. Swartz does not disclose such material, and the Examiner has not provided any teaching or reference that would motivate one of skill in the art to modify Swartz so as to obtain the claimed invention. Indeed, even if the cited references were combined as the Examiner proposes, they *still would not teach or suggest* the requirements of claim 1: neither of the references teaches or suggests an optical buffer layer, nor do the references teach or suggest a barium zirconium titanate layer in combination with an optical buffer layer. The Examiner's rejection fails to satisfy the requirements of 35 U.S.C. § 103 because Swartz and Rehrig, alone or in combination, do not disclose every element of the invention as claimed as required by *Rouffet*. *See* 149 F.3d 1357.

The Examiner also improperly rejected claims 1, 7, 8, and 14–16 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,103,000 to McKee et al. (“McKee”) in view of Rehrig. The Examiner clearly erred in relying on McKee to teach $BaZrO_3$; McKee simply does not teach this material. The Examiner also failed to show proper motivation for modifying the optical structure of McKee to include the 2 to 20 mol % of $Zr(BaZrO_3)$ material disclosed by Rehrig to teach the limitations of independent claim 1 and amended independent claim 15. The Examiner has not, therefore, met the requirements of § 103(a) and thus has not established obviousness.

The Examiner relies on McKee for disclosing $BaZrO_3$ for optical structures, as recited in independent claims 1 and 15. This reliance constitutes a clear error, because, once again, McKee

does not teach the claimed material. As discussed on page 6 of the Amendment, McKee discloses perovskite BaTiO_3 , in which, in some embodiments, Zr or Hf may be substituted on the A site for barium in ABO_3 material. This is not equivalent to the claimed BaZrO_3 , in which Zr is substituted on the B site.

The Examiner also erroneously relies on Rehrig for the teaching of a material comprising 2 to 20 mol % Zr(BaZrO_3). As discussed on page 7 of the Amendment, Rehrig discloses this composition as having desirable piezoelectric properties. Rehrig is silent regarding the optical properties of this material. One of skill in the art would find no motivation in the cited art to substitute the Zr-doped barium titanate material of Rehrig for the material suggested by McKee for the formation of electro-optic devices as recited in independent claim 1 or to form such structure as recited in independent claim 15.

CONCLUSION

We respectfully submit that, as set forth in the foregoing remarks, there are clear errors in the Examiner's rejections.

Respectfully submitted,



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